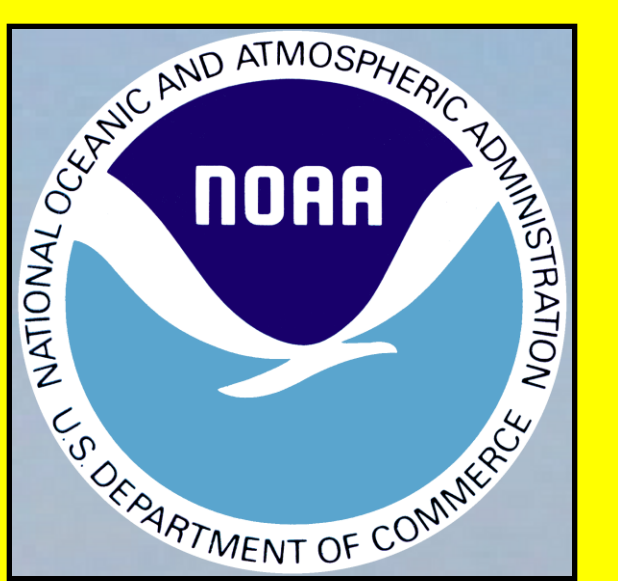


A Movie of Florida Bay Sea Level Response to Local Wind Forcing



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The Movie

The response of sea level in the interior of Florida Bay to wind forcing during 2001 dry and wet seasons is shown with a computer-generated movie of subtidal sea level anomaly fields, combined with wind vectors from Florida Bay.

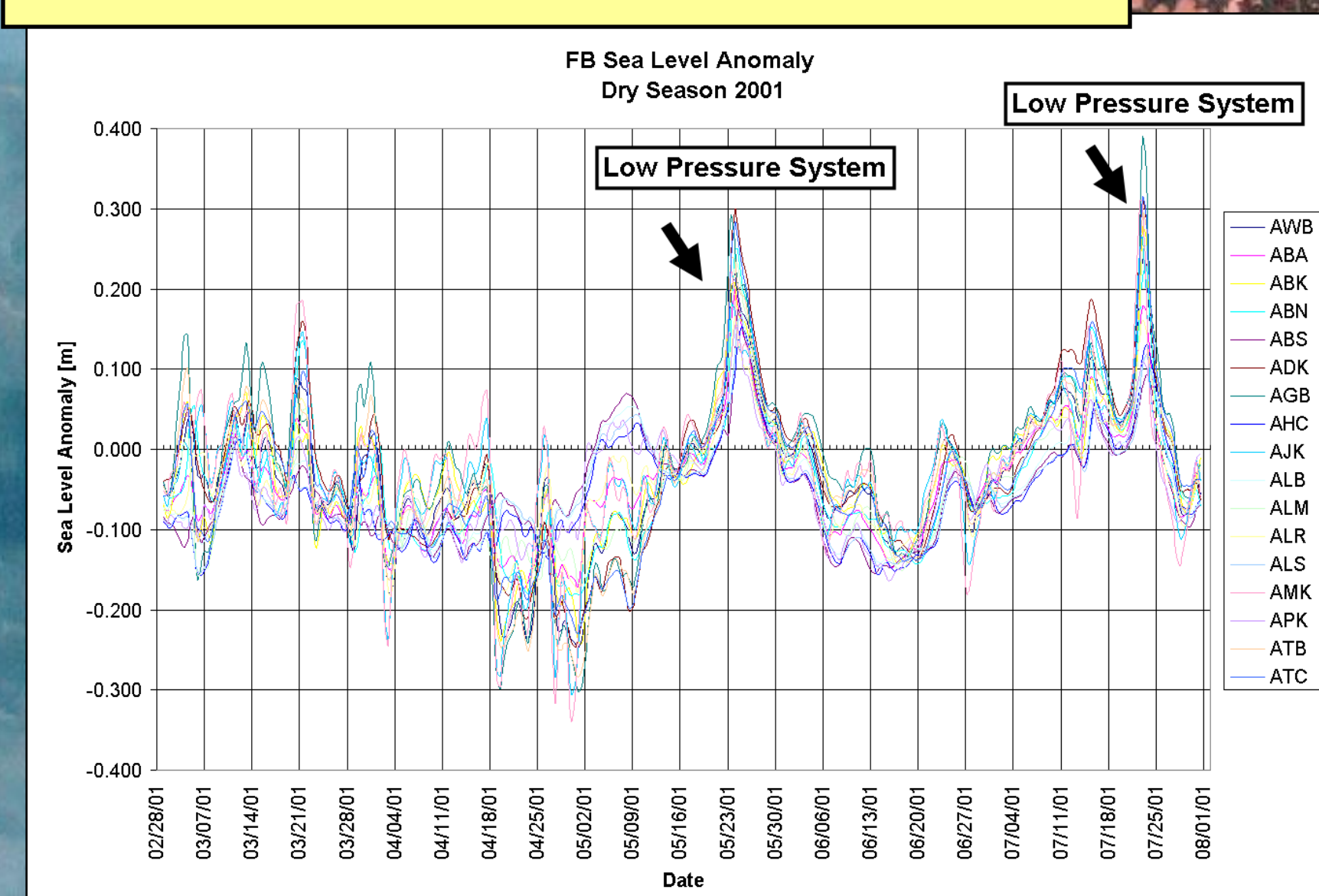
The Data

Sea level records from the ENP Marine Monitoring Network, coastal gauge records from the USGS, bottom pressure data from gauges deployed by RSMAS/AOML combined with wind vectors from the Northwest Florida Bay COMPS station and Molasses Reef C-MAN station, were used.

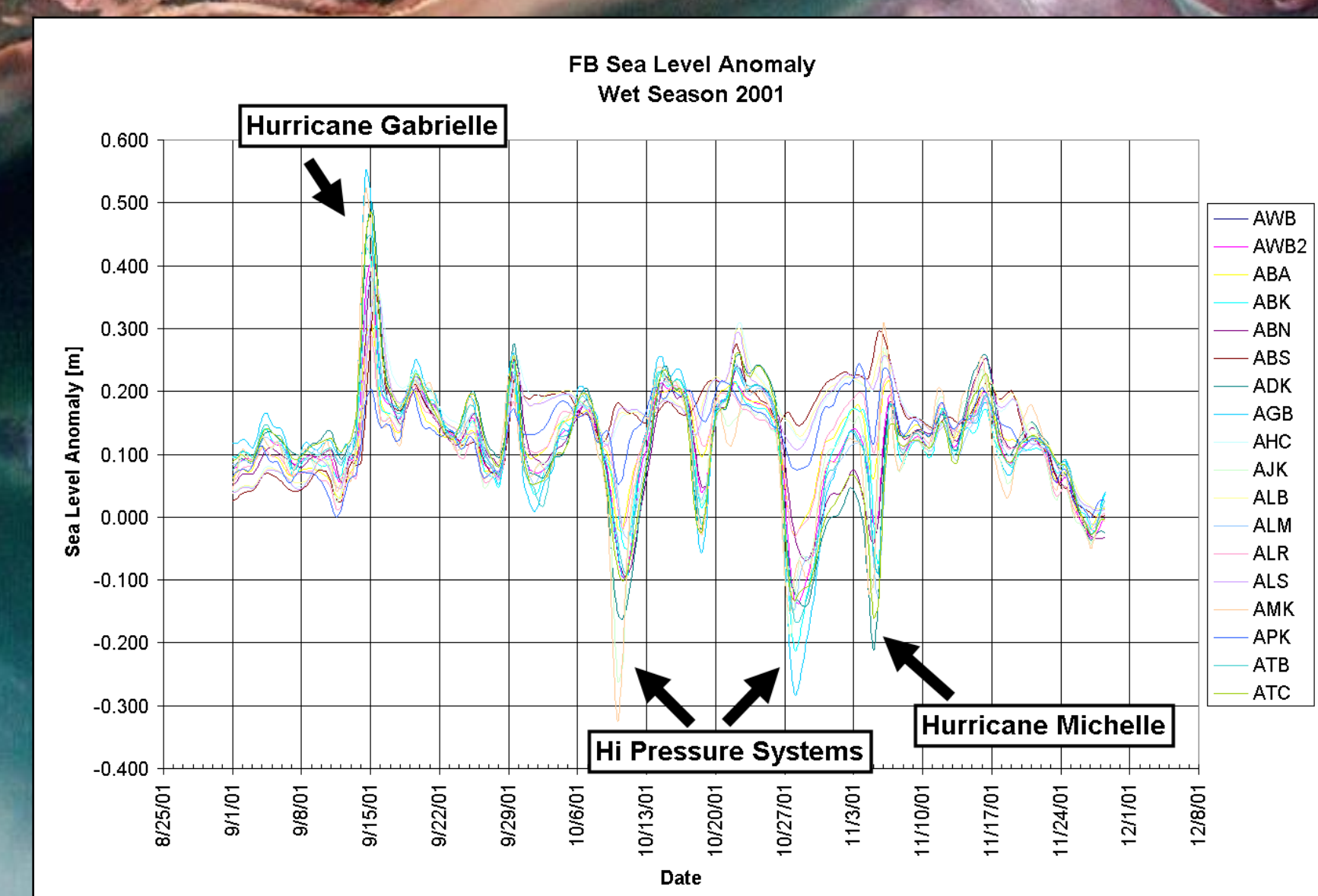
The Data Processing

The sea level records were demeaned over the year 2001 and then filtered to remove tidal variations. The resulting sea level anomaly time series were optimally interpolated to produce sea level anomaly fields for Florida Bay every 12 or 24 hours, which were then combined in a continuous movie loop that also displays the low pass filtered wind vector on each scene.

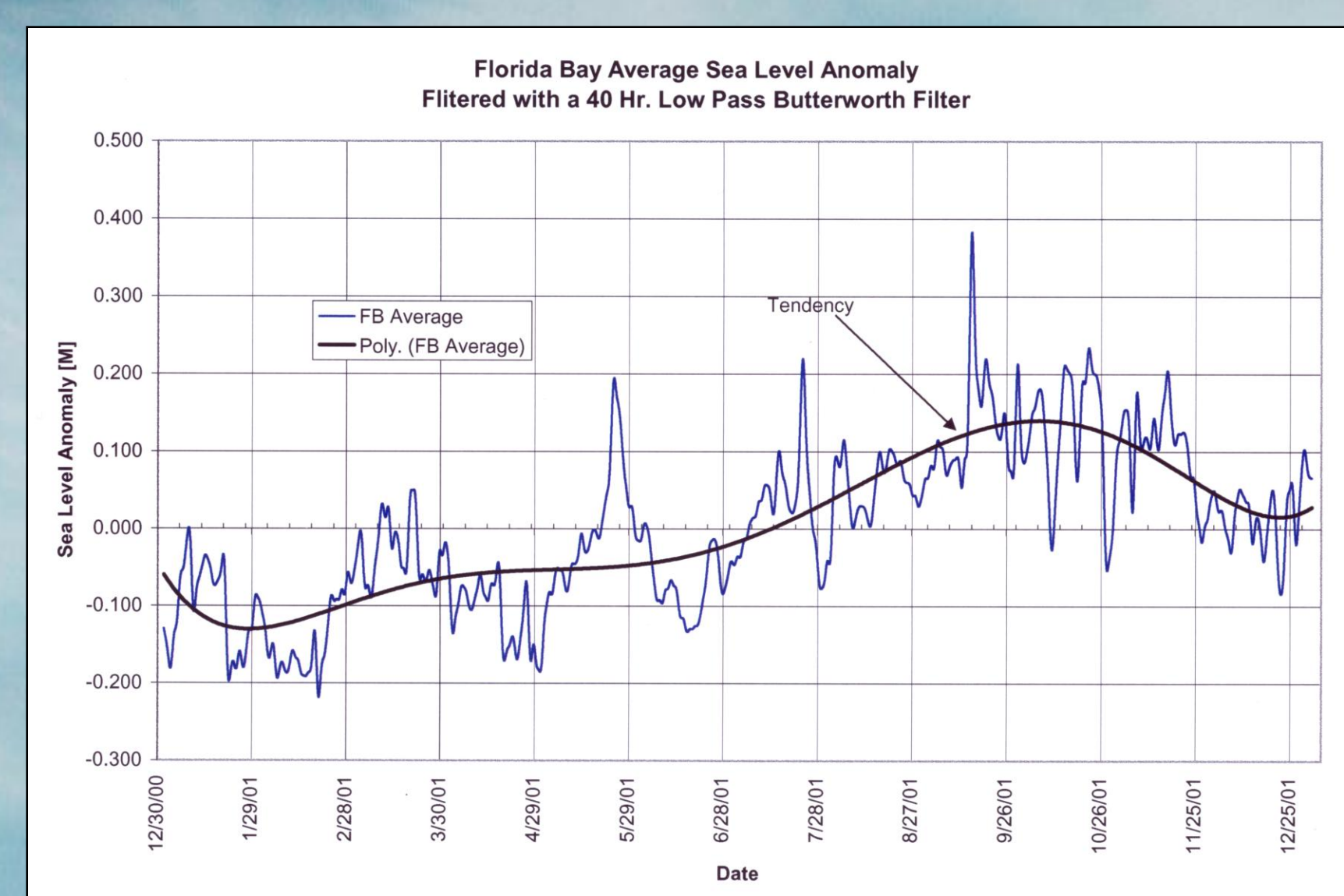
Sea Level Time Series



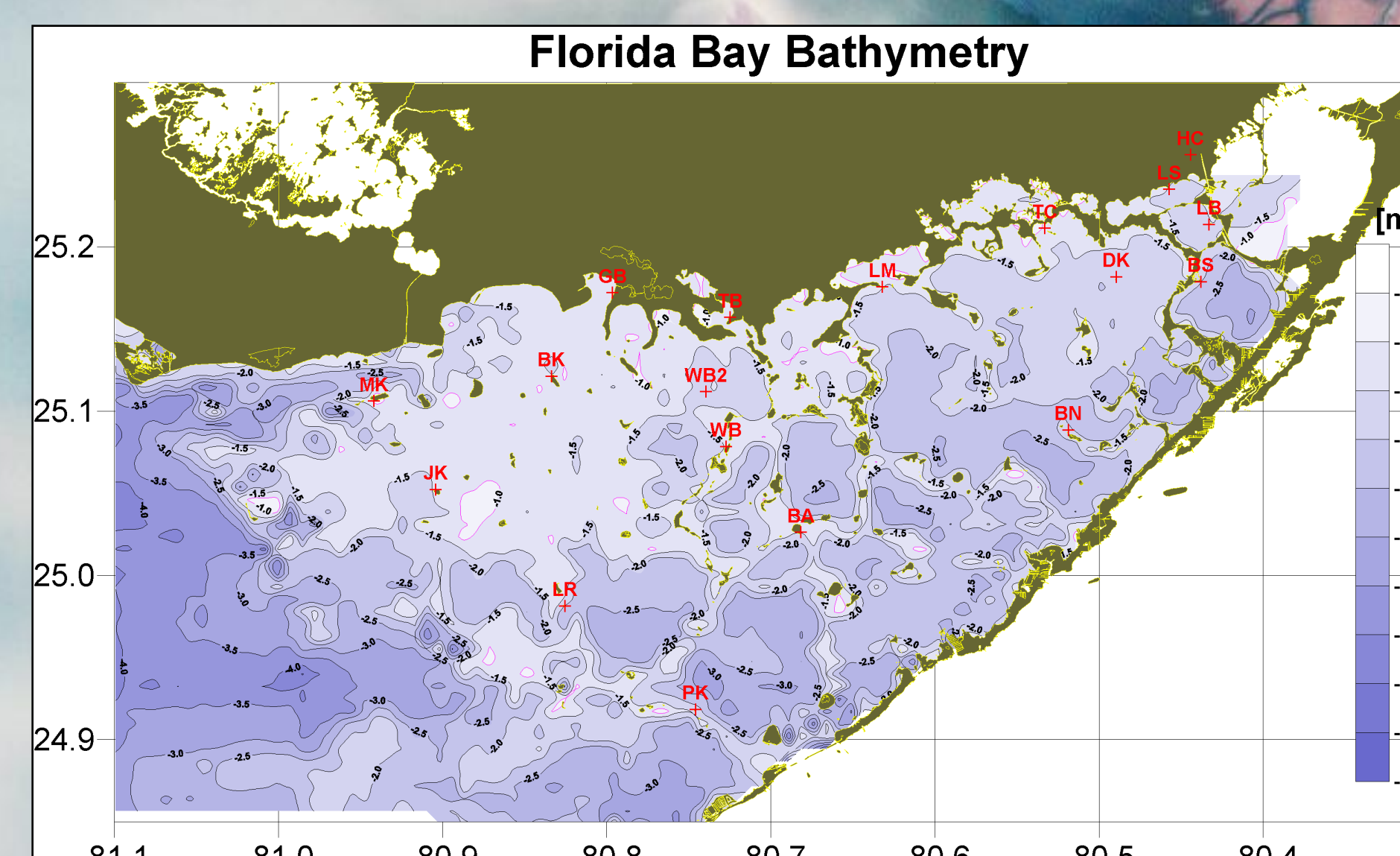
Dry Season



Wet Season

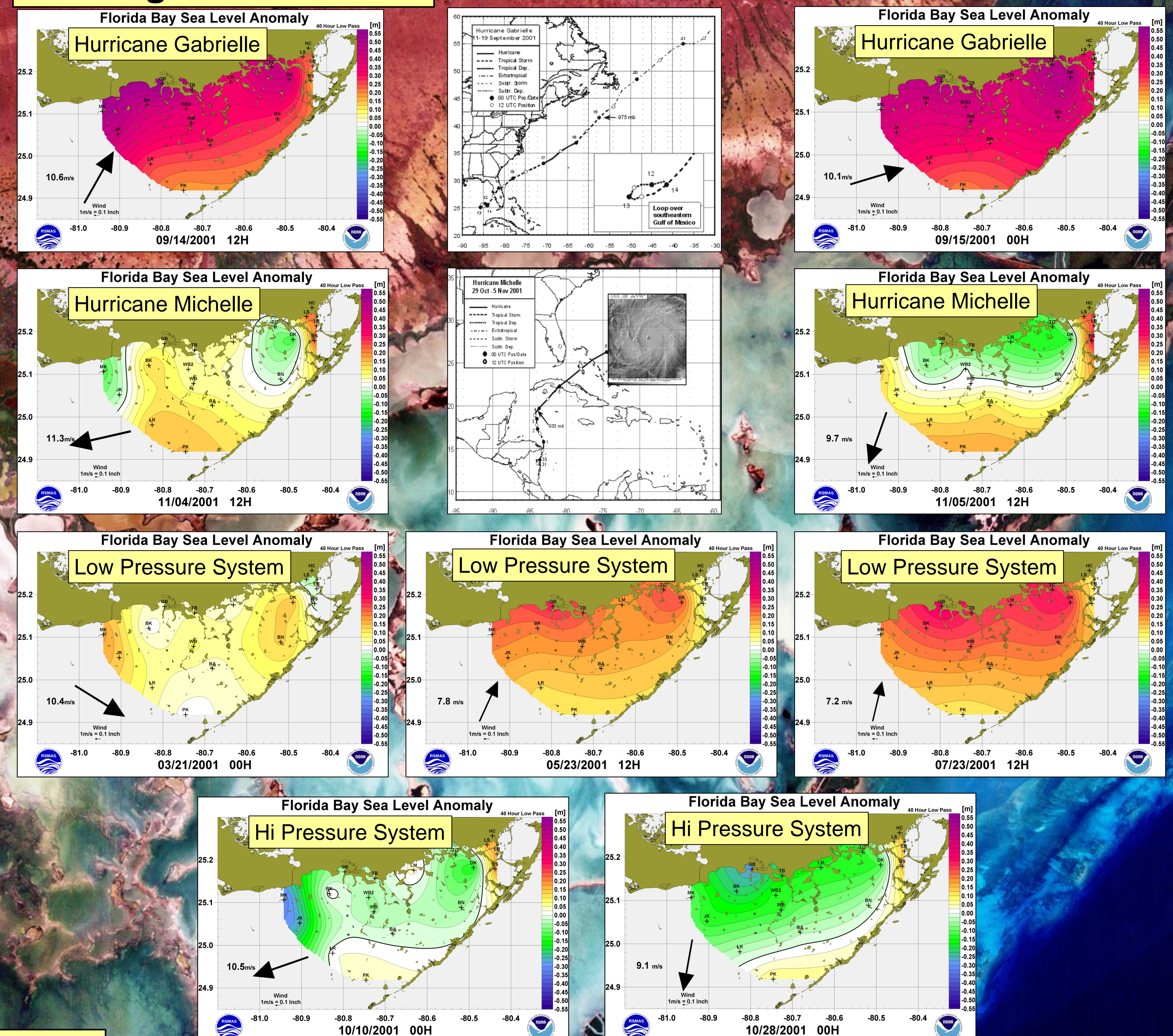


Sea Level Tendency



FB Bathymetry

Strong Wind Events



The Results

The movie shows Florida Bay sea level to be highly coherent and in-phase with local wind forcing. The largest sea level changes occur along the northern boundary where sea level rises (falls) of +/- 30 to 40 cm can occur with northward (southward) sustained winds of 10 m/s. This response occurs as a direct set-up (set-down) of sea level across the northern basins. Inter-basin coherency is high and sea level variations tend to be in-phase across the entire Bay. Strong prevailing winds from the east - west can also cause a setup of sea level along the basins boundaries with an east - west sea level slope. Winds from the southwest and west cause sea level to rise to a greater extent in the northeast region of the Bay resulting in a positive sea level anomaly there. In Florida Bay the sea level reaches a seasonal minimum during the winter months in response to an increase in prevailing winds out of the north.

The resolution available from the monitoring network is sufficient to suggest that there can be significant sea level slopes in individual basins associated with strong wind forcing, in addition to a wider-scale sub regional response. The movie can be used to aid in determining the deployment locations of additional sea level stations in order to enhance the spatial resolution of the sea level fields.